

WHAT IS CLAIMED IS:

1. A printing apparatus for printing on a printing medium by a printhead, the apparatus comprising:

5 scanning means, on which said printhead is mounted, for reciprocally moving said printhead in a first direction;

conveyance means for conveying said printhead in a second direction different from the first direction;

10 first detection means for detecting a position of said scanning means with respect to the first direction;

first filter means for filtering out high-frequency noise overlaying a first detection signal
15 generated by said first detection means according to conditions that reflect a movement condition of said scanning means; and

printing control means for printing by controlling said printhead based on the first detection
20 signal from which the noise has been filtered out by said first filter means.

2. The apparatus according to claim 1, wherein said scanning means includes a carriage motor for moving a
25 carriage on which said printhead is mounted.

3. The apparatus according to claim 2, wherein said

first detection means includes:

a scale, provided along the first direction,
along which transparent and opaque regions are
alternately provided at predetermined intervals; and

5 an encoder, provided on said carriage, that
irradiates light onto the scale and generates an
encoder signal as the first detection signal by
detecting light that passes through any one of the
transparent regions.

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4. The apparatus according to claim 3, wherein said
first filter means is a low pass filter (LPF) that
filters out high-frequency noise overlaying the encoder
signal.

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5. The apparatus according to claim 4, wherein said
LPF includes:

an edge detector for detecting a leading edge and
a trailing edge of the encoder signal;

20 a mask signal generator for generating a mask
signal of a predetermined length after detecting an
edge by the edge detector; and

a level holder for holding a signal level of the
encoder signal during a period of generating the mask
25 signal.

6. The apparatus according to claim 5, wherein said

LPF has a first operating mode for operating so that the mask signal generator generates the mask signal of a predetermined time length.

- 5 7. The apparatus according to claim 6, wherein said LPF further includes:

 a measuring unit for measuring a cycle of the encoder signal from the leading edge and the trailing edge of the encoder signal detected by the edge
10 detector; and

 a second mode for operating so as to generate a mask signal of a length that is $1/n$ times as the cycle of the encoder signal measured by the measuring unit.

- 15 8. The apparatus according to claim 7, wherein:

 said encoder generates at least a first encoder signal and a second encoder signal of different phases; and

 said LPF further comprises a third operating mode
20 for operating so as to generate the mask signal after the edge detector detects a change in signal level of the first encoder signal and until a signal level of the second encoder signal changes.

- 25 9. The apparatus according to claim 8, wherein said printing control means operates said LPF in the first operating mode while the carriage begins to accelerate

from a state of rest to a time at which a change in a velocity of the carriage becomes stable,

said printing control means operates said LPF in either the second mode or the third mode when the
5 change in the velocity of the carriage becomes stable, the carriage continues to further accelerate until the carriage reaches a state of constant velocity movement, and up to a region in which the carriage begins to decelerate from the state of the constant velocity
10 movement and such change in velocity becomes unstable,

said printing control unit operates said LPF in the first operating mode after the carriage reaches the region in which such change in velocity becomes unstable until the carriage stops.

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10. The apparatus according to claim 1, wherein said printhead is an inkjet printhead that prints by discharging ink.

20 11. The apparatus according to claim 1, wherein said inkjet printhead is provided with an electrothermal transducer for generating heat energy to be applied to ink so as to discharge the ink by utilizing the heat energy.

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12. The apparatus according to claim 1, further comprising:

second detection means for detecting a position of the printing medium with respect to the second direction;

second filter means for filtering out noise
5 overlaying a second detection signal generated by said second detection means according to conditions which reflect a conveyance state by said conveyance means; and

conveyance control means for performing
10 conveyance control of the printing medium, based on the second detection signal from which the noise has been filtered out by said second filter means.

13. The apparatus according to claim 12, wherein said
15 conveyance means includes a conveyance roller and conveyance gear for conveying the printing medium.

14. The apparatus according to claim 12, wherein the second detection means includes:

20 a disk-like scale, provided on the conveyance gear, along which transparent and opaque regions are alternately provided at predetermined intervals; and
a rotary encoder, provided near the conveyance gear, that irradiates light onto the scale and
25 generates an encoder signal as the second detection signal by detecting light that passes through any one of the transparent regions.

15. The apparatus according to claim 12, wherein said conveyance means includes a paper feed roller and conveyance gear for conveying the printing medium.

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16. The apparatus according to claim 12, wherein said conveyance means includes a paper discharge roller and conveyance gear for conveying the printing medium.

10 17. The apparatus according to claim 12, wherein said second filter means is a low pass filter (LPF) that filters out high-frequency noise overlaying the encoder signal.

15 18. The apparatus according to claim 17, wherein said LPF includes:

an edge detector for detecting a leading edge and a trailing edge of the encoder signal;

20 a mask signal generator for generating a mask signal of a predetermined length after detecting an edge by the edge detector; and

a level holder for holding a signal level of the encoder signal during a period of generating the mask signal.

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19. The apparatus according to claim 18, wherein said LPF has a first operating mode for operating so that

the mask signal generator generates the mask signal of a predetermined time length.

20. The apparatus according to claim 19, wherein said
5 LPF further includes:

a measuring unit for measuring a cycle of the encoder signal from the leading edge and the trailing edge of the encoder signal detected by the edge detector; and

10 a second mode for operating so as to generate a mask signal of a length that is $1/n$ times as the cycle of the encoder signal measured by the measuring unit.

21. The apparatus according to claim 20, wherein:
15 said encoder generates at least a first encoder signal and a second encoder signal of different phases; and

said LPF further comprises a third operating mode for operating so as to generate the mask signal after
20 the edge detector detects a change in signal level of the first encoder signal and until a signal level of the second encoder signal changes.